

SEP 15 2005

32692

Customer Number

Patent
Case No.: 58911US002

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

First Named Inventor: JONES, CLINTON L.

Application No.: 10/662085 Group Art Unit: 1756
Filed: September 12, 2003 Examiner: Sadula, Jennifer
Title: DURABLE OPTICAL ELEMENT

37 CFR 1.131 DECLARATION

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

CERTIFICATE OF MAILING OR TRANSMISSION [37 CFR § 1.8(a)]

I hereby certify that this correspondence is being:

deposited with the United States Postal Service on the date shown below with sufficient postage as first class mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

transmitted by facsimile on the date shown below to the United States Patent and Trademark Office at 571-273-8300.

Date

Signed by: Amber Nicholson

Dear Sir:

Clinton L. Jones, Brant U. Kolb, Emily S. Goenner, John T. Brady, and Christopher A. Haak state as follows:

1. We are coinventors of the above-identified patent application.
2. We have reviewed the above-identified patent application including the claims, and the Office Action of June 16, 2005.
3. We attest that the claimed invention described in the above-identified patent application was either reduced to practice prior to January 7, 2003, or conceived of prior to January 7, 2003 coupled with due diligence from prior to January 7, 2003 to a subsequent reduction to practice or to the filing date of the above-identified application, as evidenced by the attached copies of a portion of p. 6 and a portion of p. 9 of Notebook No. 131395.
4. All statements made of the coinventor's own knowledge are true and all statements made on information and belief are believed to be true. We acknowledge that willful false statements are

Application No.: 10/662085

Case No.: 58911US002

punishable by fine, imprisonment or both and may jeopardize the validity of the application or any patent issuing thereon.

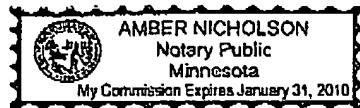
Clinton L. Jones
Clinton L. Jones

Subscribed and sworn to before me

this 15th day of September, 2005.

Amber Nicholson

Notary Public



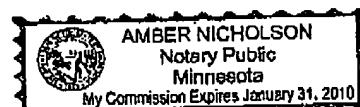
Brant U. Kolb
Brant U. Kolb

Subscribed and sworn to before me

this 15th day of September, 2005.

Amber Nicholson

Notary Public



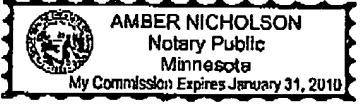
Emily S. Goerner
Emily S. Goerner

Subscribed and sworn to before me

this 15th day of September, 2005.

Amber Nicholson

Notary Public



John T. Brady
John T. Brady

Subscribed and sworn to before me

this 15th day of September, 2005.

Amber Nicholson

Notary Public



Application No.: 10/662085

Case No.: 58911US002

Christopher A. Haak
Christopher A. Haak

Subscribed and sworn to before me
this 14th day of September, 2005.

Carrie M Arcand
Notary Public



3M CONFIDENTIAL - DO NOT REPRODUCE

PAGE

NOTEBOOK NO. 131395 6

1 PROJECT NO.

SUBJECT:

DATE:

Object

5 Refer

10

DO NOT WRITE IN THIS MARGIN

15

20

25

30

35

Today I met with John Brady (AMTC) to discuss the possibility of adding high index nanoparticles to resins to better meet the demand of customers for future products. For example, if someone requested a more flexible material than the current REF resin, could we accomplish that through reformulation with flexible materials and simply add zirconia or titania to raise the index which would typically be low for the flexible resin. John recommended trying the zirconia, which was available for \$25/lb. based on solids. John has used 5 - 10 gallon reactors in CPTC to produce zirconia particles. He also discussed core and shell materials, for example, silica wrapped with zirconia, but the index would suffer from the amorphous nature. I think using nanozirconia could really provide us with formulation flexibility and competitive advantage. John said that particle loading and compatibility issues surrounding the zirconia are similar to our experience with silica. 40-50 wt% particle loadings are possible with oligomers being much harder to obtain solubility in than monomers.

BEST AVAILABLE COPY

AUTHOR'S FULL NAME or INITIALS

Clinton L. Jones

DATE:

3M CONFIDENTIAL - DO NOT REPRODUCE

三一三〇五

PAGE

四

PROJECT

Objective:

5 | Reference:

10

15

20

30

35

AUTHOR'S FULL NAME or INITIALS Christina L. Nor DATE: 10/10/04

AUTHOR'S FULL NAME or INITIALS _____ DATE: _____

WITNESS'S FULL NAME or INITIALS ELIZABETH MILLER DATE: 10/10/01

PAGE 9/9 * RCVD AT 9/15/2005 4:36:22 PM [Eastern Daylight Time] * SVR:USPTO-EFXRF-6/26 * DNI5:2738300 * CSID:651 575 3462 * DURATION (mm:ss)02:26

Cont. on p. 10

Based on what Dave J. said about the importance of a durable resin in relationship to gain, I thought it would be worth investigating nanoparticle hardcoats that Emily Gochnner and I developed over the years. The BEF SWAT team investigated several formulations on PET using 90/65 flat tooling obtained from Mike Gross. Four formulations were used to make handspread samples using a wallpaper edging roller. The formulations were cured using a 600 w/in. D-bulb on full power at 50 fpm. The formulations were:

1. BPF II free
2. Sample C (40/40/20 SR 295/SR 238/SR 506 with 40% 20 nm A-174 functionalized silica particles)
3. Sample C w/no particles (40/40/20 SR 295/SR 238/SR 506)
4. Sample F (50/50 SR 295/SR 238 40% 20 nm A-174 functionalized silica particles)

4. Sample F (30/30 SR 29/SR 258 40% 20 nm A-174 functionalized silica particles) PVdC primed PET was used for samples 2-4. PVdC primed PET did not work for sample 1. When BEF II resin was used with PVdC primer, the resin stayed with the tool and did not release. An unmarked PET sample in the UV lab in Bldg 218 was used to make sample 1. From this small experiment, it is obvious we need to learn more about adhesion of BEF II resin to various primer systems. BEF II's ability to dissolve a primer or not react with the primer as expected is of great concern and this could hurt us immediately with the inability to release from the tool or down the road with declarifications during environmental testing.

BEST AVAILABLE COPY